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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of

Preparation for International  
Telecommunication Union World  
Radiocommunication Conferences

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IC Docket No. 94-31

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REPLY COMMENTS OF TELEDESIC CORPORATION

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

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## SUMMARY

In these Reply Comments, Teledesic Corporation joins other operators of non-geostationary satellite systems in urging the United States to advocate the elimination or modification of International Radio Regulation 2613 ("Rad. Reg. 2613") at the 1995 World Radiocommunication Conference ("WRC-95"). Rad. Reg. 2613 is inequitable to non-geostationary system operators, and there is no technical, legal, or public policy rationale for this discrimination. The immediacy of the need to eliminate or modify Rad. Reg. 2613 is starkly illustrated by the recent request by Hughes Communications Galaxy, Inc. ("Hughes") for use internationally of the entire 5 GHz of Ka band spectrum for its geostationary satellite system. Geostationary system operators such as Hughes should not be permitted to use Rad. Reg. 2613 as a competitive shield to preclude use of the Ka band worldwide by non-geostationary satellite systems. Rather, regulations should be technology neutral so that the marketplace rather than regulators determine the merits of competing satellite technologies.

Teledesic also urges the United States to preserve sufficient Ka band spectrum for non-geostationary satellite systems providing fixed satellite service. The band should not be considered the exclusive solution to a potential shortage of spectrum for mobile satellite service ("MSS") feeder links. Thus, Teledesic supports the positions of those operators of non-geostationary satellite systems providing MSS that advocate

placement of their systems' feeder links in the bands below 15 GHz.

Finally, Teledesic opposes a proposed revision to Resolution 46 (WRC-92) that eliminates a crucial protection in the international publication, notification and coordination process for operators of new satellite systems. The proposal advocated by the Voluntary Group of Experts eliminates a measure that protects operators of new satellite systems by limiting to four months the period in which other administrations may object to the proposed operating parameters of the new satellite system. Without this protection, uncertainty and delay in the international coordination process would result because other administrations would have an unlimited time period in which to oppose new systems and subject them to coordination.

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To: The Commission

**REPLY COMMENTS OF TELEDESIC CORPORATION**

Teledesic Corporation ("Teledesic"), by its attorney, and pursuant to Section 1.415 of the rules and regulations of the Federal Communications Commission ("FCC" or "Commission"), 47 C.F.R. § 1.415 (1993), hereby submits its Reply Comments in the above-captioned proceeding.<sup>1/</sup> Teledesic filed an application with the Commission on March 21, 1994, in which Teledesic proposed to construct, launch and operate an international non-geostationary satellite system in the fixed satellite service ("FSS"). Application of Teledesic Corporation, File No. 22-DSS-P/LA-94 (March 21, 1994), as amended. In these Reply Comments, Teledesic urges the United States to adopt positions at the 1995 World Radiocommunication Conference ("WRC-95") that promote the successful operation of international non-geostationary satellite systems in the 30/20 GHz band, or Ka band.

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<sup>1/</sup> By an order dated June 1, 1994, the FCC on its own motion extended the comment deadline in this proceeding to July 15, 1994, and the reply comment deadline to August 5, 1994. Preparation for International Telecommunication Union World Radiocommunication Conferences, IC Docket No. 94-31, DA 94-566 (released June 2, 1994).

## I. INTRODUCTION

In Comments filed previously in this proceeding, Teledesic advocated that International Radio Regulation 2613 ("Rad. Reg. 2613") should be modified or eliminated so that all non-geostationary satellite systems in the FSS receive equal priority with geostationary satellite systems. Comments of Teledesic Corporation, IC Docket No. 94-31, at 4-8 (July 15, 1994) ("Teledesic Comments"). Teledesic also advocated that sufficient Ka band spectrum be made available for non-geostationary FSS systems as well as for the feeder links of non-geostationary MSS systems.<sup>2/</sup> Id. at 9-13.

In these Reply Comments, Teledesic joins satellite operators in urging the United States to ensure that the playing field is level in the international satellite arena and that geostationary satellite systems are not given an unfair advantage over non-geostationary satellite systems by virtue of Rad. Reg. 2613. It is imperative that Rad. Reg. 2613 be eliminated or modified in order to foster the development of a competitive global marketplace for satellite-delivered information services. The immediacy of the need for action to eliminate or modify Rad. Reg. 2613 is starkly illustrated by the recent request by Hughes Communications Galaxy, Inc. ("Hughes") for use internationally of the entire 5 GHz of Ka band spectrum for its geostationary

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<sup>2/</sup> Although not specifically addressed in these Reply Comments, Teledesic also urged the inclusion of Recommendation 719 (WRC-92) on the agenda for the 1997 World Radiocommunication Conference because it includes issues critical to the future success of non-geostationary systems providing MSS and FSS. Id. at 13-16.

satellite system. If Rad. Reg. 2613 is not eliminated, geostationary satellite operators such as Hughes will be able to use the regulation as a competitive shield to preclude the use of the Ka band worldwide by non-geostationary satellite systems.

Teledesic in these Reply Comments also endorses the views of applicants for non-geostationary satellite systems providing mobile satellite service ("MSS") that advocate the location of their systems' feeder links in the bands below 15 GHz. Finally, Teledesic urges the Commission to reject proposed changes to advance publication requirements that would remove strict time limits in which other administrations can object to the implementation of a new international satellite system. These changes proposed by the Voluntary Group of Experts ("VGE") unnecessarily would make international coordination efforts more difficult.

**II. RADIO REGULATION 2613 SHOULD BE REVISED OR ELIMINATED PROMPTLY IN ORDER TO LEVEL THE PLAYING FIELD SO THAT NON-GEOSTATIONARY SATELLITE SYSTEMS RECEIVE EQUAL PRIORITY WITH GEOSTATIONARY SATELLITE SYSTEMS.**

Rad. Reg. 2613 should be eliminated or modified in favor of coordination procedures that are neutral with respect to the type of satellite systems involved and that remove preferential treatment of geostationary satellite systems. It is widely recognized that Rad. Reg. 2613 is inequitable to non-geostationary satellite operators providing FSS because it requires the protection of geostationary systems in all

circumstances, even where the geostationary satellite is coordinated after the non-geostationary system.<sup>3/</sup>

Unless action is taken at WRC-95 to level the playing field, the prediction of the International Telecommunication Union ("ITU") that the wide application of Rad. Reg. 2613 will prejudice the development of non-geostationary systems soon will be realized. See ITU, Final Acts of WRC-92, Malaga-Torremolinos, Resolution No. 46 ("Resolution 46 (WRC-92)"). In its amended application requesting international operating authority to construct, launch, and operate a geostationary satellite system in the entire range of spectrum in the Ka band, Hughes explicitly relied on Rad. Reg. 2613 to afford its system priority over non-geostationary systems where interference occurs. See Application of Hughes Communications Galaxy, Inc., at 84 (July 26, 1994). Under this strict interpretation of Rad. Reg. 2613, Hughes' geostationary system would have priority over any non-geostationary system in the band. As a result of the protection from interference afforded to geostationary satellite systems by Rad. Reg. 2613, the use of the Ka band by non-geostationary satellite systems for MSS or FSS effectively could be preempted

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<sup>3/</sup> See Comments of Motorola Satellite Communications, Inc. and Iridium, Inc., IC Docket No. 94-31, at 15-16 (July 15, 1994) ("Motorola Comments"); Comments of TRW, Inc., IC Docket No. 94-31, at 10-12 (July 15, 1994) ("TRW Comments"); Comments of AirTouch Communications, IC Docket No. 94-31, at 6 (July 15, 1994) ("AirTouch Comments"); Constellation Communications, Inc. Comments, IC Docket No. 94-31, at 9 (July 15, 1994) ("Constellation Comments"); Comments of Ellipsat Corporation, IC Docket No. 94-31, at 7 n.7 (July 15, 1994) ("Ellipsat Comments"); Comments of Loral/Qualcomm Partnership, L.P., IC Docket No. 94-31, at 11 (July 15, 1994) ("Loral Comments").



permanently. Even if a geostationary satellite system is coordinated after a non-geostationary satellite system, it would be able to eliminate competition from the earlier non-geostationary satellite system. Obviously, under these circumstances, no non-geostationary satellite system could ever be deployed.

Contrary to the assertion of Hughes, geostationary systems should not be permitted to retain their primary status under Rad. Reg. 2613. Comments of Hughes Space and Communications Company and Hughes Communications Galaxy, Inc., IC Docket No. 94-31, at 6-7 (July 15, 1994) ("Hughes Comments"). There is no technical, legal or public policy rationale to treat non-geostationary and geostationary satellite systems differently for purposes of international coordination. Thus, regulations must be technology neutral so that the marketplace rather than regulators determine the merits of competing satellite technologies.

Hughes is incorrect in its assertion that geostationary systems make greater frequency reuse than non-geostationary systems. Id. at 6. In contrast to geostationary satellite systems which can support multiple entry by orbital arc separation, non-geostationary systems support multiple entry by band segmentation and utilize frequency much more efficiently because of their smaller antenna footprints. For example, the Teledesic system reuses its spectrum 20,000 times globally. If all 2.5 GHz of Ka band spectrum was committed to similar non-geostationary FSS use, then the reuse of Ka band spectrum would

be ten times greater than that which geostationary FSS use of the band could provide. Moreover, non-geostationary system frequency reuse remains high regardless of whether the system provides MSS or FSS. In contrast, the efficiency of geostationary systems decreases dramatically when such systems provide MSS because mobile operations require at least nine degrees of orbital spacing, which reduces the geostationary reuse factor by more than a factor of four.

Non-geostationary satellite systems have distinct operational and technical advantages over geostationary systems. Unlike geostationary systems, a non-geostationary system can accommodate delay-sensitive data protocols and real-time applications like voice and videoconferencing on a global scale. Geostationary systems must orbit the Earth at high altitudes, thus creating a half-second delay in round-trip signal transmission which is unacceptable for many applications. The low orbit altitude of non-geostationary systems eliminates this transmission delay. It also reduces signal loss and terminal power requirements, enabling smaller, less powerful terminals and antennas. Moreover, a large non-geostationary satellite system is robust and reliable because system responsibilities are distributed among multiple independent satellites. A failure in any single satellite will not affect system performance. Geostationary systems, however, rely on far fewer centralized satellites, thus reducing overall system reliability in the event of satellite failure.

Geostationary satellites, by contrast, have certain advantages, particularly for broadcast applications where the larger footprint is desirable. While there is an important role for both geostationary and non-geostationary satellite systems, the potential of one should not be precluded entirely by an arbitrary rule favoring the other.

Although various commenters support several revisions to Rad. Reg. 2613 to diminish its draconian impact on non-geostationary satellite systems, these proposals must be rejected because they continue to prejudice non-geostationary systems. For example, the interpretation endorsed by the Commission's MSS Above 1 GHz proceeding, see TRW Comments, at 11; see also Ellipsat Comments, at 7 n.7, fails to negate the basic bias against non-geostationary systems because it ultimately requires such systems to cease operations where unacceptable interference occurs. See Teledesic Comments, at 5-6. Teledesic supports the evolving concept of giving balanced, equitable treatment to both geostationary and non-geostationary FSS operations. Thus, Teledesic joins Motorola Satellite Communications, Inc. ("Motorola") in supporting the proposal of ITU-R Task Group 4/5, which categorizes FSS bands into one of three groups in which priority is accorded to geostationary systems, to non-geostationary systems, or in which both systems have equal status. See Teledesic Comments, at 7 & n.4; see also Motorola Comments, at 15-16. However, Motorola's proposal does not go far enough because it is limited to MSS feeder links and fails to

include all FSS non-geostationary satellite operations. There is no technical or policy-based justification for treating MSS feeder links differently from any other FSS use by non-geostationary systems. Teledesic Comments, at 8.

**III. THE UNITED STATES SHOULD ACT TO PRESERVE SUFFICIENT KA BAND SPECTRUM FOR FSS NON-GEOSTATIONARY SATELLITE SYSTEMS.**

The ITU should not consider the 30/20 GHz band as the exclusive solution to a potential shortage of spectrum for MSS feeder links. As demonstrated by the comments of operators of non-geostationary satellite systems providing MSS, sufficient spectrum can be identified in the bands below 15 GHz to accommodate feeder links.

For the following reasons, it would be extremely inefficient to make extensive use of the Ka band for MSS feeder links. First, locating all MSS feeder links in the Ka band would require all operators except TRW, Inc. ("TRW") and Motorola to extensively redesign their systems. Potential costly delays in service to the public would result. Constellation Comments, at 9; Loral Comments, at 10-11; Ellipsat Comments, at 5. Second, the Ka band lacks sufficient spectrum to accommodate all MSS feeder links because of significantly increased demand for the spectrum for FSS service link use. Id. at 11-13. See also Loral Comments, at 10-11. As noted by GE American Communications, Inc., demand for Ka band spectrum has precipitated a negotiated rulemaking proceeding in the United States. Comments of GE American Communications, Inc., IC Docket No. 94-31, at 5-6 (July

15, 1994). Thus, extensive use of the Ka band for MSS feeder links is neither a simple nor efficient solution to the potential shortage of MSS spectrum. The United States must preserve this spectrum for international satellite use in a manner that accommodates FSS non-geostationary satellite systems.

**IV. RESOLUTION 46 (WRC-92) SHOULD NOT BE MODIFIED TO REMOVE DEADLINES BY WHICH ADMINISTRATIONS CAN OBJECT TO THE PROPOSED OPERATIONS OF SATELLITE SYSTEMS.**

Based on a comprehensive review of the ITU requirements imposed on international satellite operators, the VGE has produced a Final Report in which it simplifies the Radio Regulations.<sup>4/</sup> See Preparation for International Telecommunication Union World Radiocommunication Conferences, IC Docket No. 94-31, FCC 94-96, at ¶ 6 (released May 5, 1994) ("Notice of Inquiry"); see also Report by the VGE to Study Allocation and Improved Use of the Radio-Frequency Spectrum and Simplification of the Radio Regulations, IC Docket 94-31 (May 5, 1994) ("VGE Report"). However, the VGE's proposed revision of Resolution 46 (WRC-92) coordination procedures for non-geostationary satellite systems should be rejected because rather than simplifying the coordination process, the revision eliminates a crucial protection for operators of new satellite systems and makes the coordination process more difficult. Specifically, the changes would eliminate a measure that protects

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<sup>4/</sup> Teledesic supports and is participating in the WRC-95 Industry Advisory Committee established by the FCC to review the VGE Final Report and provide specific recommendations regarding its revision.

operators of new satellite systems by limiting to four months the period in which other administrations may object to the proposed operating parameters of new satellite systems. See Notice of Inquiry, at ¶ 14 n.9; see also VGE Report, at § S9. Eliminating this objection deadline unnecessarily would create uncertainty and delay in the international coordination process because it prolongs the period in which other administrations can oppose new systems and subject them to coordination.

Resolution 46 (WRC-92) presently requires advance notification of administrations to the ITU of the operating parameters of proposed non-geostationary satellite systems. Resolution 46 (WRC-92), at ¶ 1.1. This information is published in the ITU's weekly circular, and any administration has the opportunity to comment on the proposal if it believes the proposed satellite system will create interference to its existing or planned satellite or terrestrial operations. Id. ¶¶ 1.3, 1.4. The resolution also contains the following critical provision:

If no such comments [regarding interference] are received from an administration within [four months], it may be assumed that the administration has no basic objections to the planned satellite network(s) of the system on which details have been published.

Id. ¶ 1.4.

Like other commenters in this proceeding, Teledesic opposes the elimination of the four-month comment deadline, which facilitates international coordination of global non-geostationary satellite systems. This deadline limits the rights

of other administrations to make interference objections and accordingly protects new system operators from an endless coordination period. Without a specific cut-off date for objections or comments from other administrations regarding interference, satellite operators will be subject to constant uncertainty regarding the viability of their systems and will be required to undergo extended coordination procedures. Comments of Orbital Communications Corporation, IC Docket No. 94-31, at 7 (July 15, 1994); Comments of Starsys Global Positioning, Inc., IC Docket No. 94-31, at 4 (July 15, 1994) ("Starsys Comments"); TRW Comments, at 4-5; Motorola Comments, at 3. As noted by Motorola, coordination of non-geostationary systems must be governed by clearly defined procedures in order for the process to remain reasonable because these global systems require coordination with many different administrations.<sup>5/</sup> Motorola Comments, at 3.

#### **V. CONCLUSION**

For the foregoing reasons, Teledesic respectfully requests that the Commission and the United States heed the comments of non-geostationary satellite operators and support the elimination or modification of Rad. Reg. 2613 so that non-geostationary systems are accorded equal priority with geostationary systems.

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<sup>5/</sup> Also because of the large number of administrations involved in coordination with non-geostationary satellite systems, the Commission and United States should eliminate the VGE Report's requirement that operators mail requests for coordination to all potentially affected administrations. See Notice of Inquiry, at ¶ 14 n.9; see also Starsys Comments, at 3-4; TRW Comments, at 4.

Teledesic also supports the position of various non-geostationary satellite operators that seek to place the feeder links of their MSS systems in the bands below 15 GHz because it is imperative that sufficient Ka band spectrum be preserved for non-geostationary FSS use. Finally, Teledesic urges the Commission to reject proposed changes to advance publication requirements that would remove strict deadlines by which other administrations can object to the implementation of a new international satellite system.

Respectfully submitted,

TELEDESIC CORPORATION

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